35090
S/697/61/000/000/016/018
D228/D303

18.1285

AUTHORS: Danilova, G. P., Mal'tsev, M. V., Poplavko, M. V. and Vladimirskaya, T. M.

TITLE: Addition materials for welding titanium alloys

SOURCE: Akademiya nauk SSSR. Institut metallurgii im. A. A. Baykova. Institut mineralogii, geokhimii i kristallokhimii redkikh elementov. Mezhduvedomstvennaya komissiya po probleme redkim metallam. Vsesoyuznoye soveshchaniye po probleme reniya. Moscow, 1958. Reniy; trudy soveshchaniye. Moscow, Izd-vo AN SSSR, 1961, 203-208

TEXT: In this study the aim of the authors was to create a high-grade Ti alloy with a variably modified structure in the cast state. Such material is necessary to eliminate textural defects hindering the full use of certain Ti alloys in welded structures. Details are first given about the preparation of these addition ingredients -- Ti-base alloys with different contents of Al, Nb, Mo, Re, Ce,

Card 1/3

KOLOBNEV, Ivan Filippovich; MIKHEYEV, V.I., prof., doktor khim. nauk, retsenzent; MAL'TSEV, M.V., prof., doktor tekhn. nauk; MISHARINA, K.D., red. izd-va; ISLENT'YEVA, P.G., tekhn. red.

[Heat treatment of aluminum alloys] Termicheskaia obrabotka aliuminievykh splavov. Moskva, Gos.nauchno-tekhn. izd-vo lit-ry po chernoi metallurgii, 1961. 413 p. (MIRA 14:6)

(Aluminum alloys—Heat treatment)

APPROVED FOR RELEASE: 06/23/11: CIA-RDP86-00513R001031900027-6

~~MAL'TSEV, M.V.~~

Organization of underground gas storage at the Ekhabi field (Northern Sakhalin). Gaz. prom. 5 no. 12:35-38 D '60. (MIRA 14:1)

(Sakhalin—Gas, Natural)

MAL'TSEV, M.V.

Gathering and transport of casing-head gases in Northern Sakhalin. Gaz.prom. 5 no.11:36-38 N '60. (MIRA 13:11)
(Sakhalin--Gas, Natural)

MAL'TSEV, M.V.

Some characteristics of oil prospecting in the Tatar A.S.S.R. Geol. nefti i gaza 4 no. 12:7-11 D '60. (MIRA 13:12)

1. Tatarskiy nauchno-issledovatel'skiy neftyanoy institut.
(Tatar A.S.S.R.--Prospecting)

APPROVED FOR RELEASE: 06/23/11: CIA-RDP86-00513R001031900027-6

Alloys of Magnesium...... S/509/60/000/004/004/024
E021/E106

Calcium and zinc had a positive effect up to 0.5-1%, further additions showing no change. Low additions of manganese and aluminium gave a decrease in hardness. Further additions gave an increase. The greatest effect on the prolonged hardness at 300 °C was shown by 0.6-1% manganese. Cerium also showed an increase, but to a lesser degree.
There are 5 figures, 6 tables and 3 English references.

Fig.2

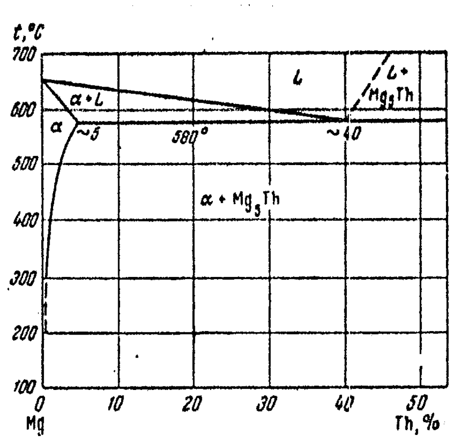

Рис. 2. Диаграмма состояния сплавов Mg — Th

Card 3/3

89632

S/509/60/000/004/004/024
E021/E106

Alloys of Magnesium Containing Thorium

occurred in the hardness of magnesium in the cast and stabilised conditions with increase in thorium content to 4%. Further increases in thorium content to 6-10% had not much effect. The hardness decreased somewhat after the stabilisation treatment. After quenching the alloys from 565 °C, the hardness increased with increasing thorium content up to 10%. The prolonged hardness gave extremely high values. From microstructural and thermal analysis it was shown that the magnesium-thorium system is of the eutectic type. The eutectic consists of α-solid solution and the compound Mg_5Th, melting at 40-42% thorium and 580 °C, (Fig.2). The solubility of thorium at the eutectic temperature is 5% and at 300 °C, 0.5%. Microhardness measurements showed that the hardness of the compound was 306 kg/mm^2, the eutectic was 118 kg/mm^2, and the solid solution was 74 kg/mm^2, corresponding to a hardness for magnesium of 47 kg/mm^2. The effect of the additions of the various elements was studied using an alloy containing 3% thorium. Cerium had the greatest effect on the properties at room temperature, the hardness continuously increasing up to 6% cerium.

Card 2/3

89632

18.1245

S/509/60/000/004/004/024
E021/E106

AUTHORS: Drits, M.Ye., Mal'tsev, M.V., Sviderskaya, Z.A., and Padezhnova, Ye.M.

TITLE: Alloys of Magnesium Containing Thorium

PERIODICAL: Akademiya nauk SSSR. Institut metallurgii. Trudy, No.4, 1960. Metallurgiya, metallovedeniye, fiziko-khimicheskiye metody issledovaniya, pp. 74-83

TEXT: Several binary and ternary magnesium-thorium alloys have been investigated using additions of manganese, cerium, aluminium, zinc, calcium and zirconium. The properties of magnesium-thorium alloys and also the effects of the additions on the properties at both room and elevated temperature were examined. The alloys were cast in a 20 mm diameter metallic mould heated to 50-60 °C. The main method of investigating the properties consisted of short-time (30 sec) and long-time (60 min) hardness measurements. The hardnesses were measured at room temperature and 300 °C using a 10 mm ball and a 100 kg load. The alloys were stabilised at 300 °C for 100 hours before testing. Measurements were also made after quenching from 565 °C. A marked increase

X

Card 1/3

DANILOVA, G.P., DRUZHININA, I.P., MAL'TSEV, M.V.

Investigating the effect of heat treatment on the mechanical properties of titanium alloys. Titan i ego splavy no.3:52-57 '60.
(MIRA 13:7)

(Titanium alloys--Heat treatment)

KUBICHEK, L.; MAL'TSEV, M.V.

Modification of the phase in Al-Mg alloys. Issl.splav. tsvet.met. no.2:165-176 '60. (MIRA 13:5)
(Aluminum-magnesium alloys--Metallography)

Investigation of Ternary Diagram of
Cu-Be-Mn System

77732
SOV/149-60-1-21/27

Mechanical properties of these bronzes can be improved by small (0.1-0.2%) Ti additions which refine the grain. In their conclusions, the authors review the above-mentioned results and recommend high-strength, heat and corrosion resistant Be-Mn alloys containing 1.2-1.3% Be, 3.7-5.5% Mn, and the rest Cu; or 0.9-1.0% Be, 7-8% Mn, the rest Cu; or 0.6-0.7% Be, 12-13% Mn, balance, Cu. There are 6 figures; and 1 table.

ASSOCIATION: Krasnoyarsk Institute of Nonferrous Metals. Chair of Physical Metallurgy (Krasnoyarskiy institut tsvetnykh metallov. Kafedra metallovedeniya)

SUBMITTED: January 23, 1959

Card 9/9

Investigation of Ternary Diagram of Cu-Be-Mn System

77732
SOV/149-60-1-21/27

Key to Table: (A) Composition, %; (B) Reduction by cold rolling after hardening, %; (C) Mechanical properties after 9 hrs tempering at 300°; (D) Vickers Hardness; (E) Tensile strength kg/mm^2; (F) Elongation, %.

Card 8/9

Investigation of Ternary Diagram of Cu-Be-Mn System

77732
SOV/[illegible]

Table
Mechanical properties of Cu-Be-Mn alloys after combined mechanical working and heat treatment.

(A)		(B)	(C)		
Be	Mn		(D)	(E)	(F)
0,6	12,2	0	217	72	26
		20	265	82	20
		40	303	90	16
		60	339	95	11
		80	352	105	[illegible]
0,9	7,3	0	[illegible]69	85	25
		20	290	89	19
		40	330	97	15
		60	369	105	[illegible]
		80	381	116	5
1,2	5,5	0	321	98	20
		20	350	107	15
		40	394	115	8
		60	407	118	[illegible]
		80	416	126	4
Br-Be [illegible]		0	[illegible]	1[illegible]9	[illegible]2
		[illegible]	410	1[illegible]5	[illegible]2

Card 7/9

Investigation of Ternary Diagram of Cu-Be-Mn System

77732
SOV/14[illegible]-1-11 [illegible]

Also interesting are alloys with 0.9 and 1.2% Be. At low Mn concentrations (1-2.3%) additional strength is imparted by two strengthening components γ and $MnBe_2$. Alloys which showed the greatest strengthening after aging, underwent complete tests as shown in the Table below. A characteristic feature of these alloys, as compared to binary beryllium bronzes, is their high plasticity both when hardened and aged (δ = 13-25% against <2%).

Card [illegible]

APPROVED FOR RELEASE: 06/23/11: CIA-RDP86-00513R001031900027-6

Investigation of [illegible] of Cu-Be-Mn System

77[illegible] SOV/14[illegible]-1-21/27

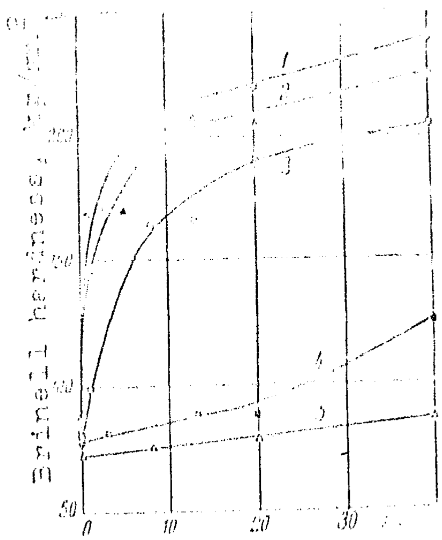

Fig. 4. Changes in hardness of Cu-Be-Mn alloys (0.6% Be) depending on aging time at 300° C and Mn content (%): (1) 12.6; (2) 9.12; (3) 7.29; (4) 5.47; (5) 3.65.

Card 5/9

that at [illegible]°C, part of the alloy is semi-liquid. At 700°C all of them are solid. At 600°C a new phase, γ, appears, following a peritectoid reaction. Due to high solubility of Mn, its content can be brought up to 12% which adds strength as alloying material and by heterogenization with $MnBe_2$ phase. Hardness depending on Mn content and aging is shown in Fig. 4.

APPROVED FOR RELEASE: 06/23/11: CIA-RDP86-00513R001031900027-6

depending on composition and temperature, the alloys had either α-structure of a monophase solid solution; binary structure α + $MnBe_2$ and $\alpha + \gamma$; or ternary $\alpha + \gamma$ (CuBe) + $MnBe_2$. All these phases are easily identified according to color, shape, different microhardness. The hardest is $MnBe_2$, 1,413 kg/mm^2. Phase transformations were determined on a Le Chatelier-Saladin device, and thermograms revealed that in Cu-Be-Mn system two nonvariant reactions are present: four-phase peritectic $\alpha + L \rightleftarrows \beta + MnBe_2$ at 768° and four-phase peritectoid $\beta + MnBe_2 \rightleftarrows \alpha + \gamma$ at 620°. Radiograms showed that $MnBe_2$ has a hexagonal lattice with periods a = 4.231 A and c = 6.909 A. Phases α and γ are solid solutions based on compound CuBe with a body-centered cubic lattice. On the base of micrographic studies, 5 isothermic and 16 polythermic cross sections were plotted, showing

Investigation of Ternary Diagram of
Cu-Be-Mn System

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SOV/1[illegible]

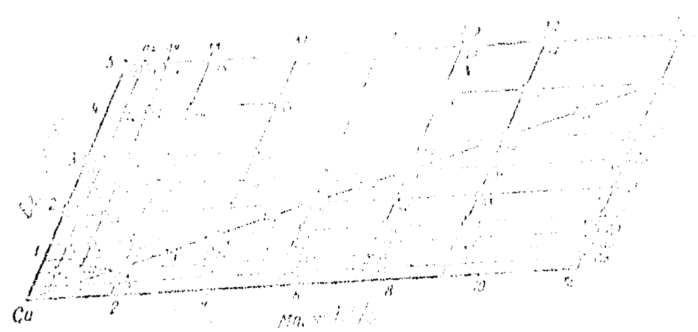

Fig. 1. Composition of investigated alloys.

Ingots were hot forged (upsetting 40-50%), homo[illegible] at 700° for 30 hr and billets cut into specimens. [illegible] latter were heated for a considerable length of ti[illegible] (12 to 24[illegible] hr at temperatures up to 400-900° C, the[illegible] rapidly quenched. A microscopic study revealed [illegible]

Card 2/9

APPROVED FOR RELEASE: 06/23/11: CIA-RDP86-00513R001031900027-6

18.1215 77632
SOV/149-60-1-21/27

AUTHORS: Mal'tsev, M. V., Chou Shih-Ch'ang

TITLE: Investigation of Ternary Diagram of Cu-Be-Mn System

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Tsvetnaya metallurgiya, 1960, Nr 1, pp 138-144 (USSR)

ABSTRACT: Attempts are being made in the Soviet Union and abroad, to find a less expensive substitute for beryllium bronzes. Manganese, being highly soluble in copper, is suggested as such a partial substitute. Reference is made to an earlier work by the same authors (this journal, Nr 5, 133, 1959) where the high mechanical and elastic properties of Cu-Be-Mn systems are described. Sixty-eight alloys were prepared containing maximum 5% Be and 12% Mn as shown in Fig. 1.

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68686

S/180/60/000/01/007/027

An Investigation of Alloy of the Quarternary System: Magnesium - Manganese - Aluminium - Calcium

6% $CaCl_2$, 15-20% CaF_2 and 7-10% MgO). As starting materials the following were used: magnesium Mg1 (99.91% Mg), aluminium AV000 (99.98% Al) and alloys Mg-Mn (3.2% Mn) and MgCa (14.5% Ca). Casting of ingots was done in metallic moulds 20 mm in diameter and 115 mm high. Ingots were cut into specimens which were submitted to a corresponding thermal treatment. On the basis of microscopic analysis, isothermal cross-sections for 400 and 300 °C for alloys of the quarternary system, corresponding to a constant manganese content (1.5%) and a number of polythermal cross-sections were constructed (Figs 1 and 2). Some typical microstructures are shown in Fig 3. It was established that the industrial alloy MA9 (mean manganese content 1.5%) at an elevated content of calcium and aluminium can contain, in addition to the main strengthening phase - Mn, a number of other strengthening phases: Mg_2Ca, Al_2Ca and the β-phase. There are 3 figures and 5 references, of which 3 are Soviet and 2 English.

Card 2/2

SUBMITTED: November 25, 1959

18.1245

S/180/60/000/01/007/027
E071/E135

AUTHOR: Drits, M.Ye., Mal'tsev, M.V., Rocklin, L.L. and Udalova, O.N. (Moscow)

TITLE: An Investigation of Alloy of the Quarternary System: Magnesium - Manganese - Aluminium - Calcium

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Metallurgiya i toplivo, 1960, Nr 1, pp 59-63 (USSR)

ABSTRACT: Alloys of magnesium with additions of manganese, aluminium and calcium found some industrial application, e.g. MA9 alloy containing 1-1.8% of manganese, 0.4-0.8% of aluminium and 0.08-0.3% of calcium (remaining magnesium), which possesses high mechanical properties at room and elevated temperatures and is resistant to oxidation and corrosion. In order to obtain more information about the nature of this alloy, particularly about its structure and conditions of thermal treatment, the knowledge of the equilibrium diagram of the above quarternary system is necessary. In the present paper the results of studies of some cross-sections of this diagram are described. The alloys for the investigation were smelted in an electric resistance furnace in steel crucibles under flux VI3 (30-40% $MgCl_2$, 25-36% KCl,

Card 1/2

MAL'TSEV, M.V.

PHASE I BOOK EXPLOITATION SOV/4164

Vsesoyuznoye soveshchaniye po splavam redkikh metallov. 1st, Moscow, 1957

Redkiye metally i splavy; trudy... (Rare Metals and Alloys; Transactions of the First All-Union Conference on Rare-Metal Alloys) Moscow, Metallurgizdat, 1960. 438 p. 3,150 copies printed.

Sponsoring Agencies: Akademiya nauk SSSR. Institut metallurgii; USSR Komissiya po redkim metallam pri nauchno-tekhnicheskom komitete.

Ed.: I.I. Shapovalov; Ed. of Publishing House: O.M. Kamayeva; Tech. Ed.: P.G. Islent'yeva.

PURPOSE: This collection of articles is intended for metallurgical engineers, physicists, and workers in the machine-building and radio-engineering industries. It may also be used by students of schools of higher education.

COVERAGE: The collection contains technical papers which were presented and discussed at the First All-Union Conference on Rare-Metal Alloys, held in the Institute of Metallurgy, Academy of Sciences USSR in November 1957. Results of investigations of rare-metal alloys, titanium, and copper-base alloys with additions of rare metals are presented and discussed along with investigations of rhenium, vanadium, niobium, and their alloys. The effect of rare-earth metals on properties of magnesium alloys and steels is analyzed. The uses of rhenium as a dehydrating catalyst, electroplating material, and material suitable for making plugs for automobile electrical systems are discussed. Also, the effect of the addition of certain elements on the properties of heat-resistant steel is examined and alloys with special physical properties (particularly semiconductive alloys) are discussed. No personalities are mentioned. Soviet and non-Soviet references accompany some of the articles.

PART II. TITANIUM, AND COPPER-BASE ALLOYS WITH RARE-METAL ADDITIONS

Rare Metals (Cont.) SOV/4164

Card 6/8

MAL'TSEV, M.V.

PHASE I BOOK EXPLOITATION SOV/4164

Vsesoyuznoye soveshchaniye po splavam redkikh metallov. 1st, Moscow, 1957

Redkiye metally i splavy; trudy... (Rare Metals and Alloys; Transactions of the First All-Union Conference on Rare-Metal Alloys) Moscow, Metallurgizdat, 1960. 438 p. 3,150 copies printed.

Sponsoring Agencies: Akademiya nauk SSSR. Institut metallurgii; USSR Komissiya po redkim metallam pri nauchno-tekhnicheskom komitete.

Ed.: I.I. Shapovalov; Ed. of Publishing House: O.M. Kamayeva; Tech. Ed.: P.G. Islent'yeva.

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PART II. TITANIUM, AND COPPER-BASE ALLOYS WITH RARE-METAL ADDITIONS

Rare Metals (Cont.) SOV/4164

Card 5/8

MAL'TSEV, M.V.

PHASE I BOOK EXPLOITATION SOV/4164

Vsesoyuznoye soveshchaniye po splavam redkikh metallov. 1st, Moscow, 1957

Redkiye metally i splavy; trudy... (Rare Metals and Alloys; Transactions of the First All-Union Conference on Rare-Metal Alloys) Moscow, Metallurgizdat, 1960. 438 p. 3,150 copies printed.

Sponsoring Agencies: Akademiya nauk SSSR. Institut metallurgii; USSR. Komissiya po redkim metallam pri nauchno-tekhnicheskom komitete.

Ed.: I.K. Shapovalov; Ed. of Publishing House: O.M. Kamayeva; Tech. Ed.: P.G. Islent'yeva.

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PART II. TITANIUM, AND COPPER-BASE ALLOYS WITH RARE-METAL ADDITIONS

Rare Metals (Cont.) SOV/4164

PART III. RHENIUM, VANADIUM, NIOBIUM, ZIRCONIUM AND ALLOYS BASED ON THEM

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10

can serve as a manual for analyzing the structural composition of various light-metal alloys. The book was written by instructors at the Department of Physical Metallurgy of the Moskovskiy institut tsvetnykh metallov i zolota im. M. I. Kalinina (Moscow Institute of Nonferrous Metals and Gold imeni M.I. Kalinin). Subsection 1, Section 2, of Chapter V (Antifriction alloys) was written by F.A. Borinyy, Docent, Candidate of Technical Sciences. Subsection 1, Section 3, of Chapter I (Tin bronzes) was compiled by T.A. Barsukova, Docent, Candidate of Technical Sciences. Subsections 2-5, Section 3, of Chapter I (Aluminum bronzes, lead bronzes, silicon bronzes, manganese bronzes) were written by M.V. Mal'tsev in collaboration with T.A. Barsukova. The remaining chapters of the book were written by M.V. Mal'tsev, who also did the general editing of the book. Laboratory worker V.D. Rodionenko helped in preparing the photographic illustrations included in the Appendix. The authors thank A.A. Bochvar, Academician; I.I. Novikov, Docent, Candidate of Technical Sciences; and the reviewers, V.F. Golovin, Professor, General-Major of Corps of Engineers; A.F. Usov, Docent, Candidate of Technical Sciences; Ye. V. Panchenko, Docent, Candidate of Technical Sciences; and B.I. Krimer, Docent, Candidate of Technical Sciences, for their assistance in compiling this book. There are 80 references: 78 Soviet and 2 English.

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SOV/4550

PHASE I BOOK EXPLOITATION

Mal'tsev, Mikhail Vasil'yevich, Professor, Doctor of Technical Sciences, Tamara Aleksandrovna Barsukova, and Fedor Andreyevich Borin

Metallografiya tsvetnykh metallov i splavov; s prilozheniyem atlasa makro- i mikrostruktur (Metallography of Nonferrous Metals and Alloys, Including an Atlas of Macrostructures and Microstructures) Moscow, Metallurgizdat, 1960. 372 p. 5,200 copies printed.

General Ed.: M.V. Mal'tsev, Professor, Doctor of Technical Sciences; Reviewers: A.F. Golovin, Professor, A.F. Usov, Candidate of Technical Sciences; Ye. S. Shpichinetskiy; Ed. of Publishing House: O.M. Kamayeva; Tech. Ed.: Ye. B. Vaynshteyn.

PURPOSE: This book is intended for use as a textbook by students at metallurgical institutes. It can also be useful to workers in metallurgical laboratories at factories and scientific research institutes.

COVERAGE: The authors describe the structures, properties, and uses of commercial nonferrous metals and alloys. The structures of the more typical alloys are illustrated in photographs which have been incorporated into an atlas. The atl

Card ~~1/6~~

APPROVED FOR RELEASE: 06/23/11: CIA-RDP86-00513R001031900027-6

MAL'TSEV, M.V.

PHASE I BOOK EXPLOITATION SOV/3602

Akademiya nauk SSSR. Institut metallurgii

Issledovaniye splavov tsvetnykh metallov; sbornik 2 (Analysis of Nonferrous Metal Alloys; Collection of Articles, [illegible]) Moscow, Izd-vo AN SSSR, 1960. 202 p. Errata slip inserted. 2,800 copies printed.

Ed.: I.A. Oding, Corresponding Member, USSR Academy of Sciences; Ed. of Publishing House: V.S. Rzheznikov; Tech. Ed.: T.P. Polenova; Editorial Board: A.A. Bochvar, Academician; M.Ye. Drits, Candidate of Technical Sciences (Deputy Resp. Ed.); M.V. Zakharov, Professor, Doctor of Technical Sciences; E.S. Kadaner, Candidate of Technical Sciences (Resp. Secretary); A.I. Kurdyumov, Doctor of Technical Sciences; M.V. Mal'tsev, Professor, Doctor of Technical Sciences; and Z.A. Sviderskaya, Candidate of Technical Sciences.

PURPOSE: This collection of articles is intended for workers in scientific research institutes, metal and machine works, for teaching personnel, and for students attending schools of higher education.

COVERAGE: This is the second volume in the series [illegible] on nonferrous [illegible] metal alloys prepared by the Institut metallurgii [illegible] A.A. Baykov [illegible] Institute of Metallurgy imeni A.A. Baykov of the Academy of Sciences [illegible], and [illegible] Institut [illegible] metallov [illegible] Mal'tsev [illegible] Institute of Nonferrous Metals and [illegible] M.I. Kalinin. The [illegible] discussed concern the casting and physical metallurgy of nonferrous alloys, the effect [illegible] of various alloys, and [illegible] with the study of the [illegible] [illegible]

[illegible] The [illegible] of Nonferrous Metal [illegible] 135

[illegible], and [illegible] [illegible] in the [illegible] After [illegible] 140

[illegible] and [illegible] The Development of [illegible] in [illegible] Castings 145

[illegible] and M.V. Mal'tsev. [illegible] 148

[illegible] The Effect of Impurities on the Mechanical Properties [illegible] 157

[illegible] 164

[illegible] 169

[illegible]

MAL'TSEV, M.V.

PHASE I BOOK EXPLOITATION SOV/3602

Akademiya nauk SSSR. Institut metallurgii

Issledovaniye splavov tsvetnykh metallov; sbornik 2 (Analysis of Nonferrous Metal Alloys; Collection of Articles, [No.] 2) Moscow, Izd-vo AN SSSR, 1960. 204 p. Errata slip inserted. 2,800 copies printed.

Ed.: I.A. Oding, Corresponding Member, USSR Academy of Sciences; Ed. of Publishing House: V.S. Rzhevnikov; Tech. Ed.: T.P. Polenova; Editorial Board: A.A. Bochvar, Academician; M.Ye. Drits, Candidate of Technical Sciences (Deputy Resp. Ed.); N.V. Zakharov, Professor, Doctor of Technical Sciences; E.S. Kadaner, Candidate of Technical Sciences (Resp. Secretary); A.M. Korol'kov, Doctor of Technical Sciences; M.V. Mal'tsev, Professor, Doctor of Technical Sciences; and Z.A. Sviderskaya, Candidate of Technical Sciences.

PURPOSE: This collection of articles is intended for workers in scientific research institutes, metal and machine works, for teaching personnel, and for students attending schools of higher education.

COVERAGE: This is the second volume in a series of works on nonferrous and [illegible] metal alloys prepared by the Institut metallurgii imeni A.A. Baykova AN [illegible] Institute of Metallurgy imeni A.A. Baykov of the Academy of Sciences [illegible], and the Moskovskiy institut tsvetnykh metallov i zolota imeni M.I. Kalinina (Moscow Institute of Nonferrous Metals and Gold imeni M.I. Kalinin). The problems discussed concern the casting and physical metallurgy of nonferrous alloys. The effect of alloying and deformation on the properties of various alloys, and the problems connected with the study of the casting properties and with the plotting of phase diagrams for nonferrous alloys are discussed. [illegible] personalities are mentioned. References accompany most of the articles.

66902

SOV/126-8-1-19/25

Study of High Thermal Conductivity Refractory Alloys of the System Cu-Co-Be

of alloys of the Cu-CoBe range as quenched from 470°C and tempered. Fig 7 shows the temperature dependence of the heat conductivity of alloys of Cu-CoBe range as quenched from 470°C and tempered. The authors arrive at the following conclusions: Cu-CoBe alloys, as the result of tempering after quenching, have great heat and electrical conductivities as compared with copper. The Wideman-Franz ratio is applicable to these alloys. There are 7 figures, 2 tables and 3 Soviet references.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet imeni M. V. Lomonosova (Moscow State University imeni M. V. Lomonosov)

SUBMITTED: February 7, 1958

Card 4/4

66902

Study of High Thermal Conductivity Refractory Alloys of the System Cu-Co-Be

SOV/126-8-1-19/25

1011°C. The following heat treatment of alloys of the above system was carried out: quenching in water from 990°C after 2 hours' soaking and tempering at 470 and 500°C. It was found that all alloys within the composition range of the quasi-binary system Cu-CoBe hardened considerably after heat treatment, their hardness increasing by 3-4 times (Fig 2). The best results were obtained after tempering at 470°C. The heat and electrical conductivities of alloys of the above system was measured. The composition of the alloys thus investigated is given in Table 2. In Fig 3 the change in hardness of alloys of the system Cu-CoBe in the aged state is shown in relation to composition. Fig 4 shows the temperature dependence of the specific electrical resistance of Cu-Be-Co alloys in the quenched state. In Fig 5 isotherms of the specific electrical resistance of alloys in the Cu-CoBe range of the system Cu-Co-Be as measured after quenching are shown. Fig 6 shows the temperature dependence of the electrical resistivity

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66902
Study of High Thermal Conductivity Refractory Alloys of the System Cu-Co-Be SOV/126-8-1-19/25

(Cu + 6% Be) were used as the basic materials. Melting was carried out in a graphite heater furnace under barium chloride flux. The ingots were cast into cast iron moulds, homogenized and forged with a reduction of 50%. Specimens for further investigations were made from the deformed billets. The equilibrium diagram was constructed with the help of microscopic investigations and differential thermal analysis. For this purpose the alloys were heated to various temperatures, held there for a long time, in order to ensure equilibrium conditions, and quenched in water. The limiting solubility of the chemical compound CoBe in copper at various temperatures was established by means of microscopic analysis. The differential thermal analysis was carried out with the help of a Le-Chatelier-Saladin pyrometer. From the results of the analysis the solidus of the above system was determined. No liquidus was plotted. The equilibrium diagram for the quasi-binary system Cu-CoBe was constructed (Fig 1), this is a eutectic type of system, and the eutectic temperature is

Card 2/4

66967

SOV/126-8-1-19/25

18.7000
18.1200

AUTHORS: Mal'tsev, M.V., Mikryukov, V. Ye. and Chou Shih-ch'ang

TITLE: Study of High Thermal Conductivity Refractory Alloys of the System Cu-Co-Be

PERIODICAL: Fizika metallov i metallovedeniye, 1959, Vol 8, Nr 1, pp 140-146 (USSR)

ABSTRACT: The chemical compound CoBe can act as a hardener of copper alloys only in the range of the quasi-binary system Cu-CoBe. Its existence may be proved by means of X-ray structural analysis. In the X-ray photograph of a powder of the alloy Cu + 3.5% Be + 22.9% Co (i.e. 26.4% CoBe) two systems of lines were obtained, one of which corresponds to the face-centred cubic lattice of the copper-base α-solid solution, and the other to the body-centred cubic lattice of the chemical compound CoBe. Microscopic investigations have also confirmed the presence of two phases in the alloy: the α-solid solution and the chemical compound CoBe. In order to construct the equilibrium diagram for the quas[i-] binary system Cu-CoBe, 13 alloys were prepared (Table 1 Electrolytic copper, cobalt and the binary alloy Cu-Be

Card 1/4

SOV/128-59-5-16/35

Inoculation Mechanism of Certain Aluminum Alloys

be done with 0,1% circonium (Fig. 6a and 6b). Modification of silumin with sodium can be done as well (Fig. 7). By the modifications, eutectics are formed. Two or three eutectoidal points are possible, too, e.g. an alloy consisting of Al, Si and Al_2Cu. (Fig. 8a, 8b). By formation of the eutectics the cristallisation process is so fine that a smaller cristal grain is the result. There are 5 photographs, 1 diagram, 2 graphs and 5 Soviet references.

Card 2/2

18(3) SOV/128-59-5-16/35

AUTHOR: Kubichek, L., Engineer and Mal'tsev, M.V., Doctor of Technical Sciences

TITLE: Inoculation Mechanism of Certain Aluminum Alloys

PERIODICAL: Liteynoye Proizvodstvo, 1959, Nr 5, pp 28-30 (USSR)

ABSTRACT: In Reference 1 the effect of the modification of a magnesium (10,2%)-aluminum alloy by boron (0,1%) is shown. Formation of a ß (Mg_5Al_8)-phase can be observed as well as, after the modifying process, the formation of a dendrite structure (Fig. 1). The increase of cristallizing is clearly shown in Fig. 2. For the formation of cristals the surface tension of the magnesium-aluminum alloy is of great importance. The effect of the various elements are shown graphically in Fig. 3. By keeping the alloy at high temperatures the absorbed layer is destroyed. Fig. 4 a shows a MgAl - alloy before and Fig. 4 b after modification with metallic calcium. Fig. 4 v shows the structure after 45 minutes heating up to 700°C. Modification can also

Card 1/2

SOV/180-59-3-29/43

The Influence of Several Elements on the Surface Tension of the Alloy ML5

materials (Li, Ca, Sb, Sr, Pb, Ba, Bi) in additions of up to 0.2 - 0.3 at % decrease the surface tension. In a given subgroup of the periodic table, the elements with higher atomic numbers have the greatest effect. It is thought that the grain refining action of the surface active elements is caused by adsorption phenomena. Modification by Ti, Mo, Zr and B is caused by the elements or their compounds acting as nucleation centres. There is 1 figure and 4 references, 2 of which are Soviet, 1 English and 1 German.

SUBMITTED: February 26, 1959

Card 2/2

SOV/180-59-3-29/43

AUTHORS: Kubichek, L. and Mal'tsev, M.V. (Moscow)

TITLE: The Influence of Several Elements on the Surface Tension of the Alloy ML5

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Metallurgiya i toplivo, 1959, Nr 3, pp 144-145(USSR)

ABSTRACT: The alloy ML5 has the following composition: 8.8% Al, 0.53% Zn, 0.29% Mn, remainder Mg. The effects of various elements on the surface tension of the alloy was investigated by the maximum pressure of a gas bubble. Argon containing 0.01 nitrogen and less than 0.01 oxygen was used, after thoroughly drying. Melting was carried out under a flux. The surface tension of 99.9% pure Mg at 700°C was 550 ± 15 dynes/cm and that of ML5 at 700°C was 535 ± 15 dynes/cm. Change in aluminium content from 0.5 - 10 wt% had practically no effect on the surface tension. Additions of other elements were made in the pure form for low melting point metals or as Al or Mg master alloys for elements with high melting points. The results are shown in the figure where surface tension is plotted against percentage addition for various elements. Surface active

Card 1/2

Investigation of the Alloys of the Ternary Magnesium-Manganese-Calcium System

SOV/180-59-3-28/43

$\alpha + \beta$(Mn) and α + Mg_2Ca regions. There are 3 figures and 5 references, 2 of which are Soviet, 2 German and 1 English.

SUBMITTED: November 24, 1958

Card 2/2

SOV/180-59-3-28/43

AUTHORS: Drits, M.Ye., Mal'tsev, M.V. and Rokhlin, L.L. (Moscow)

TITLE: Investigation of Alloys of the Ternary Magnesium-Manganese-Calcium System

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Metallurgiya i toplivo, 1959, Nr 3, pp 142-144 (USSR)

ABSTRACT: The magnesium corner of the ternary diagram was investigated for up to 2% Mn or Ca. The alloys were prepared from 99.91% Mg, and Mg-Ca and Mg-Mn master alloys. They were cast in metal moulds. Samples were homogenised at 480°C for 100 hours. They were then heated to various temperatures for long periods and quenched in water. Typical structures obtained are shown in Fig 1: a is α solid solutions, b is α + β(Mn), c is α + Mg_2Ca, and d is α + Mg_2Ca + β(Mn). Micro-hardness measurements were taken. Results were Mg_2Ca - 108 kg/mm^2 and Mn - 994 kg/mm^2. Thermal analysis showed that there is a peritectic reaction at 553°C:- liquid + β(Mn) ⇄ α + Mg_2Ca. Isothermal and polythermal sections are given in Fig 2 and 3 respectively. It can be seen that a decrease in temperature results in a decrease in the range of α solid solution and of

Card 1/2

Investigation of Alloys of the Ternary System: Titanium, Aluminum, Niobium

75395
SOV/149-2-5-21/32

hexagonal lattice with a somewhat smaller identity period than the α-phase. The α-solid solution has also a hexagonal lattice, the identity periods of which decrease at higher temperature. (There are no conclusions concerning the properties of these different alloys.) There is 1 table; and 6 figures.

ASSOICATION: Krasnoyarsk Institute of Nonferrous Metals; Chair of Metal Studies. State Institute of Rare Metals; Alloy Lab (Krasnoyarskiy institut tsvetnykh metallov; kafedra metallovedeniya. Gosudarstvennyy institut redkikh metallov; laboratoriya splavov).

SUBMITTED: January 23, 1959

Card 3/3

Investigation of Alloys of the Ternary System: Titanium, Aluminum, Niobium

75395
SOV/149-2-5-21/32

tion during annealing). The structure of the alloys at different temperatures was determined by heating them to 700, 800, 900 and 1,100° for 120, 80, 48, 10 and 3 hr respectively and by quenching them in cold water. A study of the microstructure showed that specimens quenched at 1,100° have an acicular structure of martensite type. This α-phase is the product of the β-phase breakdown, and is distributed in the grains of the β-phase along definite planes, not at random. A 900° quenching shows a low-temperature phase situated against the background of the decomposed β-phase. Both the α and the α'-phases show a regular pattern in the β-phase pattern. At lower quenching temperatures the amount of α-phase increases. At and above 1,000° the alloys are in the region of β-solid solutions. At 900° an isothermal cross section shows beside β alloys also $\alpha + \beta$ binary and α-one phase alloys. A more detailed phase analysis was made by radiograms according to Debye's method in standard cells with copper radiation. It was found that the acicular α' phase which resulted from the decay of the β-phase has a close-packed

Card 2/3

75399
SOV/149-2-5-23/32

18.000

AUTHORS: Mal'tsev, M. V., Danilova, G. P., Avidon, A. R.

TITLE: Investigation of Alloys of the Ternary System: Titanium, Aluminum, Niobium

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Tsvetnaya metallurgiya, 1959, Vol 2, Nr 5, pp 145-150 (USSR)

ABSTRACT: Certain properties and compositions of these alloys have been already described by Andreyeva, V. V., et al. (Vysokoprochnye i korrozionnostoykie splavy na osnove titana, VINTI, 1958--High-Strength and Corrosion-Resistant Titanium-Base Alloys, VINTI, 1958). Their excellent ductility and weldability prompts further studies of other compositions. However, state diagrams of these ternary systems do not exist, and to fill this lacuna the authors prepared 20 titanium alloys containing from 1 to 6% Al and from 0.25 to 6% Nb. The melts were made in an arc furnace in an atmosphere of argon; the ingots were hot (800-900°) forged into 10 x 10 mm rods, 150-mm long, cut into specimens, annealed for 45 hr at 1,100° (the specimens were sealed in quartz ampoules to avoid oxida-

Card 1/3

Influence of Certain Transition Elements on the Structure and Properties of Copper-Beryllium Alloys

75393
SOV/149-2-5-19/32

is extremely strong and is heat and electrically conductive. It can be used in the electric industry, in molds for die-casting, etc. There are 4 tables; 9 figures.

ASSOCIATION: Moscow Institute of Nonferrous Metals. Chair of Physical Metallurgy (Moskovskiy institut tsvetnykh metallov. Kafedra metallovedeniya)

SUBMITTED: October 15, 1958

Card 4/4

Influence of Certain Transition Elements on the Structure and Properties of Copper-Beryllium Alloys

75393
SOV/149-2-5-19/32

$TiBe_2$ is not determined as yet. All these compounds are very effective hardening agents. The greatest effect is observed near the saturation point. The hardness of these alloys increases 3-3.5 times after aging, as compared with the hardness of the same alloys after quenching. Specially recommended are the proportions: 0.3% Be, 1.96% Co (2.26% CoBe); 1.5% Be, 4.6% Mn (6.08% $MnBe_2$); 1.2% Be, 3.70% Mn (4.86% $MnBe_2$); 1% Be, 2.7% Ti (3.66% $TiBe_2$); and 0.80% Be, 2.1% Ti (2.93% $TiBe_2$). The hardness of these alloys after annealing is respectively 269, 341, 317, 302, and 291 kg/mm^2 (Vickers) and approach in this respect the beryllium bronzes BrB2 and BrB2,5. They are characterized by a slow softening on heating. Tempering, even after 60 hr, does not soften them noticeably. These alloys can be recommended as a substitute for beryllium bronzes in springs, membranes, and other elastic parts. The alloy containing 0.3 to 0.35% Be and 1.9 to 2% Co

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Influence of Certain Transition Elements on the Structure and Properties of Copper-Beryllium Alloys

75393
SOV/149-2-5-19/32

melted in a h.f. furnace, cast in iron molds, forged and upset to 50% of their height, and annealed at temperatures ranging from 700 to 950° during 10 to 30 hr. Then the billets were cut into specimens, welded into quartz tubes, heated from 10 to 240 hr to temperatures from 400 to 1,000°, and quenched in cold water. The quasi-binary structure was studied with the help of X-ray analysis and microhardness tests. Temperatures of phase transformations were determined by differential thermal analysis using the LeChatelier-Saladin device. It was found that three of the above alloys, Cu-CoBe, Cu-$MnBe_2$, and Cu-$TiBe_2$, are quasi-binary; the other two do not show chemical compounds: X-rays only disclose the existence of chromium and iron phases and of a solid solution. CoBe has a body-centered cube lattice with an identity period a = 2.60 A; $MnBe_2$ has a hexagon lattice of the $MnZn_2$ type with identity periods a = 4.231 A and c = 6.909 A; the structure of

Card 2/4

75393
SOV/149-2-5-19/32

18.0000

AUTHORS: Chzhou Shi-chan, Mal'tsev, M. V.

TITLE: Influence of Certain Transition Elements on the Structure and Properties of Copper-Beryllium Alloys

PERIODICAL: Izvestiya vysshikh uchebnykh zvedeniy. Tsvetnaya metallurgiya, 1959, Vol 2, Nr 5, pp 133-142 (USSR)

ABSTRACT: (Author does not refer to previous work in this field.) The excellent qualities of beryllium bronzes are offset by the high cost of beryllium. It is, therefore, of great importance to find less expensive additives capable of substituting a part of beryllium. They are the transition elements Ti, Cr, Mn, Fe, and Co. They form with berryllium chemical compounds of the type RBe_2 or RBe having a high degree of hardness. They combine with copper in quasi-binary systems as Cu-CoBe, Cu-$TiBe_2$, etc. Five series of such alloys were prepared: Cu-$TiBe_2$, Cu-$CrBe_2$, $CuMnBe_2$, $CuFeBe_2$ and Cu-CoBe. The alloys were

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APPROVED FOR RELEASE: 06/23/11: CIA-RDP86-00513R001031900027-6

KUBICHEK, L.; MAL'TSEV, M.V.

Effect of certain elements on the surface tension of aluminum-magnesium alloys. Izv.vys.ucheb.zav.; tsvet.met. 2 no.4:112-117 '59. (MIRA 13:1)

1. Moskovskiy institut tsvetnykh metallov i zolota. Kafedra metallovedeniya.
(Aluminum-magnesium alloys) (Surface tension)

SOV/180-59-2-24/34

Investigation of Alloys of the Ternary System Magnesium-Thorium-Manganese

etching with 0.5% nitric acid. Fig 1 shows some microstructures. Fig 2 shows isothermal sections, and Fig 3 polythermal sections for 1% Th and 8% Th. The nature of the phases was further studied with the aid of X-ray structural analysis and local microhardness determinations. Thermal analysis of certain alloys was carried out to determine phase-change temperatures.

Card 2/2 There are 3 figures and 3 references, 2 of which are Soviet and 1 German.

SUBMITTED: November 19, 1958

APPROVED FOR RELEASE: 06/23/11: CIA-RDP86-00513R001031900027-6

SOV/180-59-2-24/34

AUTHORS: Drits, M.Ye., Mal'tsev, M.V., and Padezhnova, Ye.M. (Moscow)

TITLE: Investigation of Alloys of the Ternary System Magnesium - Thorium - Manganese (Issledovaniye splavov troynoy sistemy magniy-toriy-marganets)

PERIODICAL: Izvestiya akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Metallurgiya i toplivo, 1959, Nr 2, pp 121-123 (+ 1 plate) (USSR)

ABSTRACT: In the work described the magnesium corner of the magnesium-thorium-manganese equilibrium diagram with up to 3% manganese and 9% thorium was investigated. The experimental work was carried out with the participation of G.M. Bordina. Grade Mrl magnesium (99.91% Mg), Mg - Mn (3.66% Mn) and Mg Th (16.72% Th) were used to prepare the alloys by fusion in steel crucibles under a flux layer (40-46% $MgCl_2$, 34.40% KCl, 5-8% $BaCl_2$ and 3-5% CaF_2). The ingots were forged at 450 °C and annealed at 550 °C for 100 hours and cut up. The specimens were sealed in quartz ampoules and subjected to prolonged heating at various temperatures followed by water quenching. Microstructures were determined after

Card 1/2

MAL'TSEV, M.V.

PHASE I BOOK EXPLOITATION SOV/3402

18(1,3)

Soveshchaniye po primeneniyu redkozemel'nykh elementov dlya uluchsheniya fiziko-mekhanicheskikh svoystv konstruktsionnykh i spetsial'nykh staley i splavov

Redkozemel'nyye elementy v stalyakh i splavakh; trudy soveshchaniya.... (Rare Earth Elements In Steels and Alloys; Transactions of a Conference on the Use of Rare Earth Elements To Improve the Physical and Mechanical Properties of Structural and Special Steels and Alloys) Moscow, Metallurgizdat, 1959. 246 p. Errata slip inserted. 3,150 copies printed.

Ed.: A. A. Prozhogin; Ed. of Publishing House: A. L. Ozeretskaya; Tech. Ed.: P. G. Islent'yeva.

PURPOSE: This book is intended for engineers, technicians and scientists engaged in the metallurgy of heavy and nonferrous metals, and may be used by students of higher educational schools, who are specializing in the metallurgical science of these metals.

COVERAGE: The book contains 14 articles which give general results of investigations and uses of rare earths as alloying components in steels and alloys. The influence of rare earth additives in improving the technical properties of structural, fire-resistant and other steels and alloys is also described. Figures, tables and references (mostly Soviet) accompany each article. No personalities are mentioned.

81494

SOV/137-59-5-10187

A Method of Obtaining Finer Grains in Aluminum Alloy Ingots

alloys were cast by the semicontinuous method into ingots of 170 and 410 mm diameter. It was established that considerably improved technological characteristics were observed in the modifications, together with much finer grains and improved mechanical properties. The proneness of the alloys to crack formation during the casting process was sharply reduced; segregational phenomena diminished; deformability improved, and the proneness to crack formation in rolling, forging and stamping was reduced. When casting the non-modified D16 alloy at a speed of 35 - 44 mm/min, 30 and 100% respectively of the ingots of 410 mm diameter showed deep surface cracks. On the other hand, modified ingots had no cracks, even at a casting speed of 50 mm/min. The introduction of modificators will increase the casting speed by 40 - 50% over the existing speeds.

N.N.

Card 2/2

81109
SOV/137-59-5-10187

18.1210

Translation from: Referativnyy zhurnal, Metallurgiya, 1959, Nr 5, p 105 (USSR)

AUTHORS: Mal'tsev, M.V., Chistyakov, Yu.D., Rogel'berg, L.N.

TITLE: A Method of Obtaining Finer Grains in Aluminum Alloy Ingots

PERIODICAL: Sb. nauchn. tr. Nauchno-tekhn. o-vo, tsvetn. metallurgii, Mosk. in-t tsvetn. met. i zolota, 1958, Nr 29, pp 54 - 71

ABSTRACT: To obtain finer grains and to increase the technological and mechanical properties of ingots produced by semi-continuous casting, modificators, such as Ti, Zr, V, Ta, Nb, Cr, Mo, W and B, were introduced into commercial Al-basis alloys (AMts, D16, AM 10). The investigations were carried out under laboratory and industrial conditions. Admixtures were added in the form of binary Al alloys (with a content of the given element in the alloy as high as 3 - 6%) in amounts of 0.005, 0.01, 0.05, 0.1 and 0.2%. Laboratory experiments showed that the admixtures of Ta, B, Ti and Zr were most effective for AMts alloys; Ta, Ti, B, V and Mo for D16 alloys, and Ti, V, B for AM10 alloys. AMts and D16 alloys were investigated under industrial conditions. After modification the

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SOV/24-58-8-16/37

Influence of Thorium on the Heat Resistance of Magnesium and Some of its Alloys

zinc. Engineer I. M. Bavykina and G. M. Bordina participated in the experiments.
There are 6 figures and 5 tables and 3 references, all of which are English.

SUBMITTED: October 8, 1957

1. Heat resistant alloys--Properties 2. Magnesium--Properties 3. Magnesium alloys--Mechanical properties 4. Magnesium alloys --Temperature factors 5. Magnesium alloys--Test results 6. Thorium --Metallurgical effects

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SOV/24-58-8-16/37

Influence of Thorium on the Heat Resistance of Magnesium and Some of its Alloys

brings about an increase in the hardness. In Fig.6 the influence is graphed of additions of Al, Ca, Ce, Mn and Zn on the long duration hardness of the Mg-3% Th alloy. An idea of the influence of the various components on the high temperature strength of a Mg-3% Th alloy can be gained from the data of Table 5, which contains a comparison of the short duration and the long duration hardness at 300°C (after stabilisation annealing at this temperature for 100 hours) of the ternary alloys; in addition to the better experimental results of the authors themselves, this table contains data for alloys Mg-Th-Zr and Mg-Th-Zr-Zn, alloys which are most widely publicised in Western literature. These alloys were produced by the authors and tested under conditions similar to those applied to the earlier investigated alloys. It can be seen that the highest hardening of Mg-Th alloys at elevated temperatures is ensured by such elements as Mn and Ce. For these, the highest hardness values were obtained, higher even than those containing zirconium and

Card 4/5

SOV/24-58-8-16/37

Influence of Thorium on the Heat Resistance of Magnesium and Some of its Alloys

ageing was investigated for ten hours. However, it was found that in all cases the hardness hardly changed after the first five hours. The highest hardness was obtained as a result of artificial ageing for three hours at 250°C. On the basis of the obtained results heat treatment regimes were selected for comparative investigation of the short duration and long duration hardness at 300°C; the obtained data are entered in Table 3. The hardness of ternary alloys was investigated under conditions similar to those pertaining to the binary alloys of Mg with Th; the results of these investigations as well as the compositions of the investigated alloys are summarised in Table 4. The best results at room temperature were obtained by alloying the Mg-3% Th alloy with Ce; the hardness of this alloy increased continuously with increasing Ce content. Ca and Zn have a positive influence in quantities of 0.5 to 1%. Small additions of Mn and Al lead to some decrease in the hardness and only a further increase of the Mn and Al contents

Card 3/5

SOV/24-58-8-16/37

Influence of Thorium on the Heat Resistance of Magnesium and Some of its Alloys

held for sixteen hours; heating of the specimens was effected in quartz glass ampules from which air was evacuated and which were filled with sulphur powder. The influence of thorium on the hardness of the binary Mg-Th alloys at room and elevated temperatures is graphed in Fig.1. The diagram of state of the Mg-Th system, based on the micro-structural and thermal analyses, is reproduced in Fig.2; the diagram is of the eutectic type. Fig.3 shows reproductions of the micro-structure of Mg-Th alloys for 3 and 20% Th respectively and magnifications of 315 and 1000 times. The obtained results indicate that Mg-Th alloys have a high micro-hardness (306 kg/mm^2) which approaches in value the micro-hardness of Mg_2Ni, $MgNi_2$, etc; the micro-hardness of the eutectic is 118 kg/mm^2, the micro-hardness of the solid solution is 74 kg/mm^2. The effect of hardening of these alloys during heat treatment was investigated in detail on an alloy containing 10% Th. Fig.4 shows the curves of the kinetics of hardening of this alloy in a coordinate system hardness vs. time; the progress of

Card 2/5

SOV/24-58-8-16/37

AUTHORS: Drits, M. Ye., Mal'tsev, M. V., Padezhnova, Ye. M. and Sviderskaya, Z. A. (Moscow)

TITLE: Influence of Thorium on the Heat Resistance of Magnesium and Some of its Alloys (Vliyaniye toriya na zharoprochnost' magniya i nekotorykh ego splavov)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Otdeleniye Tekhnicheskikh Nauk, 1958, Nr 8, pp 93-97 (USSR)

ABSTRACT: According to published Western data (Refs.1-3), magnesium alloys with additions of 2 to 3% thorium have a high creep stability in the temperature range 300 to 350°C and satisfactory mechanical and technological properties. The authors of this paper applied the method of investigation of the short duration and the long duration hardness for the binary alloys of magnesium and thorium and for certain ternary alloys containing in addition to thorium, Ce, Mn, Al, Ca and Zn. The results of the hardness measurements of the binary alloys of magnesium and thorium in the as-cast state and after stabilisation at 300°C are entered in Table 1. The hardness values are entered in Table 2 for the same specimens after quenching in water at 565°C, at which temperature the specimens were

Card 1/5

well spacing at the oilfield. The high operating pressure on the injection lines has made it possible to increase the volume of water injection (Ref.1). Shifts in the oil-bearing contours were determined by a 1957 TatNII study using isobar maps (Ref.2). The oil yield was increased by fracturing the formation (Ref.3). By April 1958 about 127 wells were being exploited either by EPN or SKN-5 pumps. The authors make seven suggestions for the improvement of the Romashkino oilfield exploitation. There are 2 figures, 1 table, and 3 Soviet references.

Card 2/2 1. Petroleum--USSR

SOV/93-58-7-7/17

AUTHOR: Vakhitov, G.G.; Yerunin, V.A.; Mal'tsev, M.V.; Cholovskiy, I.P.

TITLE: Present State and Future Development of the Romashkino Oilfield in the Tatar ASSR (Tekushcheye sostoyaniye i zadachi dal'neyshey razrabotki Romashkinskogo mestorozhdeniya Tatarskoy ASSR)

PERIODICAL: Neftyanoye khozyaystvo, 1958, Nr 7, pp 31-37 (USSR)

ABSTRACT: The Romashkino oilfield of the Tatar ASSR was discovered in July 1949. At this field the oil of commercial value is in the oil-bearing sands of the D_{III}, D_{II}, D_I, and D_0 (the Mikhaylovskiy) Devonian formations, as well as in the oil-bearing sands of the carbonaceous formation of lower carbon. The D_I formation is the most important and it has been arbitrarily subdivided into five layers: a, b, c, d, and e. The d and e layers have better porosity and permeability, and greater oil capacity. Fig. 1 presents the geological profiel of the Romashkino oilfield, which is being developed according to a VNII scheme. This scheme provides for the maintenance of reservoir pressure by means of water injection and this makes it possible to artificially separate the oilfield into 23 reservoirs and to exploit the five layers of the D_I formation jointly. Currently only seven of the 23 reservoirs are being commercially exploited. These are the Minnibayevskaya, Abdrakhmanovo, Pavlovskaya, Vostochno-Suleyevskaya, Zelenogorskaya, Yuzhno-Romashkinskaya, and the Al'met'yev oil reservoirs presented in Fig. 2. The Al'met'yev, Aznakayevo, and Bugul'ma oilfield administrations are in charge of the seven oil reservoirs. Table 1 presents data on

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SOV/149-58-6-12/19

Investigation of the Ternary Titanium-aluminium-niobium and Titanium-aluminium-molybdenum Alloys

Acknowledgments are made to L.V. Mel'nikova, G.G. Pauler and N.S. Kaplin, who took part in all stages of the investigation, to A.I. Gribov, B.I. Shevchenko, B.S. Kulagin, B.N. Popov and A.A. Diomidova who participated in the large-scale production trials and to Candidate of Technical Sciences, M.V. Poplavko, who directed the work on weldability of the studied alloys.
There are 5 figures, 1 table and 2 Soviet references.

ASSOCIATION: Moskovskiy institut tsvetnykh metallov i zolota. Kafedra metallovedeniya. (Moscow Institute of Non-ferrous Metals and Gold. Chair of Metal Working)

SUBMITTED: June 23, 1958

Card 7/7

SOV/149-58-6-12/19

Investigation of the Ternary Titanium-aluminium-niobium and Titanium-aluminium-molybdenum Alloys

while under the same conditions the Ti-Al-Mn and other similar alloys have δ and ψ equal to zero and very low a_k. In the final stage of the investigation, the weldability of the two alloys was studied. It was found not only that these alloys could be easily welded but also that the welded seam had good mechanical properties. Further tests revealed that the ductility of welds (measured by the angle θ through which the welded seam could be bent before the first crack appeared) could be considerably increased if small quantities of rhenium or other refractory metals were introduced in the alloys. Thus, while in the case of a weld in the 3% Al, 5% Nb alloy θ was equal to 49°, it attained the value of 112° in the same alloy containing 0.1% Re. On the basis of all the conducted tests, titanium alloys containing 3-5% Al and 4-5% Mo or 3-5% Al and 3-5% Nb can be recommended as suitable for industrial applications involving the use of welded sheet constructions.

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Investigation of the Ternary Titanium-aluminium-niobium and Titanium-aluminium-molybdenum Alloys

alloys is shown in Figures 2 and 3, respectively. It is postulated that low ductility of alloys annealed at 400 - 500 °C was due to the precipitation of the hard, metastable ω phase (not visible under the microscope) formed as a result of decomposition of the β phase. The increased ductility and reduced strength of alloys annealed at higher temperatures was attributed to the formation of stable α-phase. The variation of the mechanical properties of the investigated alloys within the -196 to + 500 °C temperature range is shown in Figure 4 (5% Al, 4% Nb alloy) and Figure 5 (4% Al, 3% Mo alloy), where a_k - impact strength, kg-m/cm^2, other symbols denoting the same properties as in Figures 2 and 3. It will be seen that unlike other alloys, such as Ti-Al-Mn, Ti-Al-Fe, Ti-Al-V, etc., the two alloys under consideration are characterised by high strength and high ductility at sub-zero temperatures. Thus, at -196 °C the 5% Al, 4% Nb alloy has

σ_B = 150 kg/mm^2, δ = 10%, ψ = 35% and a_k = 5 kg-m/cm^2,

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Investigation of the Ternary Titanium-aluminium-niobium and Titanium-aluminium-molybdenum Alloys

attained without intermediate re-heating. The hot-rolled sheet was annealed at 800 °C for 20 min and de-scaled (at 500 °C) in a salt bath consisting of 80% NaOH and 20% $NaNO_3$. This treatment was followed by bright pickling in hot (70 °C) solution containing 18% H_2SO_4, 7% NaCl and 5% $NaNO_3$, after which the material was washed in running water. The following values were obtained for U.T.S. (σ_B kg/mm^2), yield point (σ_s kg/mm^2) and elongation, δ, (%) : 96, 83, 17 for the Ti-Al-Mo alloy and 86, 73, 14 for the Ti-Al-Nb alloy. In the next stage of the investigation the effect of the annealing temperature on the mechanical properties of the alloys and the temperature dependence of these properties were studied. The effect of the annealing temperature on the reduction of area ψ (%), elongation, δ (%), U.T.S. (σ_b), yield point (σ_s) and elastic limit (σ_p) of the 4% Al, 3% Mo and 5% Al, 4% Nb

Card4/7

5) Mechanical properties - a) U.T.S. kg/mm^2, b) yield point kg/mm^2, c) elastic limit, kg/mm^2, d) elongation, %, e) reduction of area, %, f) impact strength, kgm/cm^2. It was found that higher ductility and impact strength were obtained when forging was carried out at 1 000 - 800 °C and the harmful effect of employing higher forging temperatures was attributed to the excessive growth of the β-phase which, on decomposing, produced coarse, needle-like constituents. The microstructures of the 4% Al, 3% Mo alloy hot-forged at i) 1100 - 900 °C and ii) 1 000 - 800 °C are shown in Figure 1. In view of these results, in all subsequent work the investigated alloys were forged within the 1 000 - 800 °C temperature range. A continuous oil-fired furnace was used for pre-heating, the heating cycle consisting of 2 hours at 800 °C, followed by slow heating to 1 000 °C. The ingots, cut into several parts, were forged to produce either rods or flat stock. The latter was then hot-rolled at 1 000 - 800 °C to sheet measuring 3 x 700 x 2 000 mm, 90% reduction in thickness being

Investigation of the Ternary Titanium-aluminium-niobium and Titanium-aluminium-molybdenum Alloys

best combination of strength and ductility was to be found in the alloys containing 3-4% Al and 3-5% Mo or 5-6% Al and 4-5% Nb (both of which consisted of two phases α and β, the A-phase predominating), further tests were conducted on alloys of these compositions prepared on an industrial scale. Ingots (330 mm dia, 300-400 mm high) were prepared from magnesium reduced titanium, 99.6% pure aluminium, 98.8% pure Nb powder and 99.0% pure Mo powder by melting in vacuo, in an electric-arc furnace using a consumable electrode. Chemical analysis of samples taken from the top and bottom parts of the ingots showed that no segregation had occurred (Table 1). To determine the optimum hot working temperature, the mechanical properties and the microstructure of materials forged at various temperatures were examined. The results are given in Table 1 under the following headings: 1) Nominal composition of the alloy; 2) Part of the ingot from which the samples were taken (top, bottom); 3) Chemical composition - a) alloying elements, b) impurities; 4) Hot-forging temperature;

SOV/149-58-6-12/19

AUTHORS: Mal'tsev, M.V., Danilova, G.P. and Druzhinina, I.P.

TITLE: Investigation of the Ternary Titanium-aluminium-niobium and Titanium-aluminium-molybdenum Alloys (Issledovaniye troynykh splavov titan-alyuminiy-niobiy i titan--alyuminiy-molibden)

PERIODICAL: Izvestiya Vysshikh Uchebnykh Zavedeniy, Tsvetnaya Metallurgiya, 1958, Nr 6, pp 108-114 + 1 plate (USSR)

ABSTRACT: The object of the present investigation was to study the Ti-rich alloys of the ternary Ti-Al-Nb and Ti-Al-Mo systems and to select those that by virtue of the best combination of mechanical properties (high strength and ductility) would be most suitable for manufacturing welded sheet structures designed to operate at sub-zero and elevated temperatures. In the exploratory stage, alloys containing 2-6% Al with 2-6% Mo and 2-6% Al with 1-8% Nb were studied. Magnesium reduced titanium was used in the preparation of the experimental alloys which were melted and cast in helium. The cast ingots were hot forged at 1 000 - 800 °C, to produce square rods from which test pieces for mechanical tests and metallographic examination were prepared. After it had been established that the

APPROVED FOR RELEASE: 06/23/11: CIA-RDP86-00513R001031900027-6

MAL'TSEV, M.V., doktor tekhn. nauk; VIGDOROVICH, V.N

Investigating the properties of modified aluminum bronzes. Biul. TSIIN tsvet. met. no. 6:25-28 '58. (MIRA 11:7)
(Aluminum bronze)

APPROVED FOR RELEASE: 06/23/11: CIA-RDP86-00513R001031900027-6

DANILOVA, G.P.; DRUZHININA, I.P.; MAL'TSEV, M.V.

Investigating ternary alloys of titanium-aluminum-manganese and titanium-alluminum-iron. Izv. vys. ucheb. zav.; tsvet. met. no.3:115-121 '58. (MIRA 11:11)

1. Moskovskiy institut tsvetnykh metallov i zolota. Kafedra metallovedeniya.
(Titanium-aluminum-manganese alloys--Metallography)
(Titanium-aluminum-iron alloys--Metallography)

Microhardness Measurements in the Study of Solid Solutions of the Three Component Systems.

due to an "overlapping" of these s and d electrons. Thus the addition of 1% Ti (by weight) increases the microhardness by 33 kgm/mm^2 whereas the same addition of Al (by weight) by only 12.4 kgm/mm^2. The increase in the microhardness of the studied alloys was found to be proportional and linear up to the ultimate concentration. In the case of ternary solid solutions the increase in the microhardness was found to be the sum total of the increases in the microhardness of the corresponding binary solid solutions. There are 5 figures and 8 references, all of them Soviet.

ASSOCIATION: Institut tsvetnykh metallov i zolota im. M. I. Kalinina. (Institute of Non-Ferrous Metals and Gold im. M. I. Kalinin)

SUBMITTED: November 27, 1957.

Card 3/3 1. Alloys--Microhardness--Determination

APPROVED FOR RELEASE: 06/23/11: CIA-RDP86-00513R001031900027-6

24-58-3-14/38

Microhardness Measurements in the Study of Solid Solutions of the Three Component Systems.

ing the solubility of Al and Ti in Cu. Analysis of these results has shown that the introduction of Ti essentially increases the solubility of Al in Cu especially at higher temperatures and the introduction of Al lowers the solubility of Ti in Cu. Hardening of the solid solution which accompanies the solubility of Al and Ti in Cu could be produced to a certain extent by a relative mutual solubility of the components. This mutual solubility is governed by the atomic structure, type, and the dimensions of the crystal lattice of the component. As the solubility of Ti in Cu is accompanied by a larger alteration of the crystal lattice than in the case of the solubility of Al in Cu it is to be expected that the microhardness due to Ti will be greater than that due to Al with respect to the same Cu content of an alloy. This was confirmed experimentally and is in accordance with theoretical interpretation. The introduction into the metal lattice of Cu (highly "populated" by s-electrons) of a transition metal, Ti (which has 3d subgroup not completely filled by electrons) leads to extra stronger valency forces which are

Card 2/3

MAL'TSEV, M.V.

24-58-3-14/38

AUTHORS: Vigdorovich, V.N., Krestovnikov, A.N., Mal'tsev, M.V. (Moscow)

TITLE: Microhardness Measurements in the Study of Solid Solutions of the Three Component Systems (Issledovaniye tverdykh rastvorov trekhkomponentnoy sistemy metodom mikrotverdosti)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Otdeleniye Tekhnicheskikh Nauk, 1958, Nr 3, pp 110-113 (USSR)

ABSTRACT: A series of Cu-Al, Cu-Ti, and Cu-Al-Ti alloys were prepared for experiments, the aim of which was to establish the ultimate solubility of Al and Ti in Cu and to investigate the dependence of the microhardness of a solid solution on the composition of the alloys. Changes in the microhardness with respect to composition and temperature of Cu-Al and Cu-Ti alloys allowed establishment of the most probable limit of the solubility of Ti in Cu, the "Solidus" temperature and the limit of the solubility of a ternary solid solution. Mircohardness versus composition curves confirmed a complicated structure of the solid solution in the two phase system - the microhardness of such solid solutions increased as the composition of the alloy entered the two-phase range. Changes in the microhardness of a solid solution obtained from the study of one-phase and two-phase systems served to plot the solubility isotherms and thus supplied information regard-

Card 1/3

the basis of the obtained results, a variant of the copper angle of the diagram of state Cu-Ti is drawn for titanium contents up to 20%.
There are 4 figures and 7 references - 6 Russian, 1 English.

SUBMITTED: August 1, 1957.

AVAILABLE: Library of Congress.

MAL'TSEV, M. V.

24-2-22/28

AUTHORS: Vigdorovich, V.N., Krestovnikov, A.N. and Mal'tsev, M.V.

TITLE: Investigation of the state copper-titanium diagram (Issledovaniye diagrammy sostoyaniya med'-titan).

PERIODICAL: Izvestiya Akademii Nauk SSSR, Otdeleniye Tekhnicheskikh Nauk, 1958, No.2, pp. 145-148 (USSR).

ABSTRACT: The method of zonal recrystallisation and thermal analysis was used by the author for solving the problem of presence of eutectic transformation $L \rightarrow \alpha + \beta$ taking place at the temperature 870 ± 1°C for a composition at the eutectic point of 17.1% Ti. The solubility of titanium in copper was determined by micro-hardness measurements; 7.4% Ti is the maximum limit solubility at the temperature of the eutectic horizontal. The results graphed in Fig.3 of the changes of the chemical composition along the length of a specimen of an alloy with 17.6% Ti content after zonal recrystallisation (head and tail parts) indicate the existence of a range of homogeneity corresponding to the inter-metallide $\beta(Cu_3Ti)$, the lower limit of which is about 19.6% Ti at the eutectic temperature; the micro-hardness of the compound equalled 370 ± 15 kg/mm². On

Card 1/2

APPROVED FOR RELEASE: 06/23/11: CIA-RDP86-00513R001031900027-6

VIGDOROVICH, V.N.; MAL'TSEV, M.V.; KRESTOVNIKOV, A.N.

Investigating the structure and properties of ternary system copper-aluminum-titanium alloys. Izv. vys. ucheb. zav.; tsvet. met. no.2:142-152 '58. (MIRA 11:8)

1. Moskovskiy institut tsvetnykh metallov i zolota. Kafedra metallovedeniya.

(Phase rule and equilibrium)
(Copper-aluminum-titanium alloys--Metallography)

MAL'TSEV, M.V.; YAN VAN BOK.

Investigating phase diagrams for the system aluminum - manganese - titanium. Izv. vys. ucheb. zav.; tsvet. met. no.2:130-142 '58. (MIRA 11:8)

1. Moskovskiy institut tsvetnykh metallov i zolota. Kafedra metallovedeniya.

(Phase rule and equilibrium)
(Aluminum-manganese-titanium alloys--Metallography)

SOV/137-58-10-20782

Some Steps to be Taken in Combatting Contamination of Aluminum (cont.)

castings and improvement of surface quality. Such films also have a favorable influence upon the quality of the surfaces of the ingots and the finished products in subsequent heatings for purposes of heat treatment, prior to rolling, forging, etc. For example, sheets of Al alloy with 7-8% Mg, containing 0.0005-0.005% Be as an addition, retain a bright surface when heated for 50-60 hours at 500°, while under the same conditions sheets of alloy to which no additions have been made become covered with a thick dark tarnish even after a short period of heating.

G.N.

1. Aluminum alloys--Impurities 2. Aluminum alloys--Oxidation 3. Oxide films--Metallurgical effects 4. Oxides--Metallurgical effects

Card 2/2

SOV/137-58-10-20782

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 10, p 62 (USSR)

AUTHORS: Chistyakov, Yu.D., Mal'tsev, M.V.

TITLE: Some Steps to be Taken in Combatting Contamination of Aluminum Alloys by Oxide Inclusions (O nekotorykh merakh bor'by s zagryazneniyem alyuminiyevykh splavov okisnymi vklyucheniyami)

PERIODICAL: V sb.: Legkiye splavy. Nr 1. Moscow, 1958, pp 289-297

ABSTRACT: The contamination of metal by oxide inclusions is affected by the methods employed for melting and refining (flux treatment, blowing with reductant or inert gas, etc.) and the methods of protecting the metal from oxidation during standing periods and subsequent pourings. Oxide films formed on the surface of molten metal protect it from further oxidation. Contamination of the metal with oxide inclusions depends upon the nature of this film and its properties. For Al-Mg alloys, films consisting of Mg oxide in conjunction with Be, Ca, or Li oxide provide the best protective properties. In alloys of elevated Mg contents (D16, AMr, AL8, etc.), the addition of slight amounts of Be (0.0005-0.005%) results in elimination of blackness in the

Card 1/2

SOV/137-58-10-20781

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 10, p 62 (USSR)

AUTHOR: Mal'tsev, M.V.

TITLE: Inoculation Modification of the Structure of Aluminum Alloy Ingots (Modifitsirovaniye struktury slitkov alyuminiyevykh splavov)

PERIODICAL: V sb.: Legkiye splavy. Nr 1. Moscow, 1958, pp 273-288

ABSTRACT: The quality of ingots and castings of Al and other alloys can be considerably improved by introduction of additions consisting of certain metals, e.g., Ti, Zr, V, Ta, Nb, Cr, W, Mo, and B. Even at low concentrations they form chemical compounds with Al that crystallize ahead of the Al itself or solid solutions based thereon. Particles of these compounds constitute nuclei of crystallization ensuring the formation of a finer primary structure. When Ta, Ti, and Zr are introduced into aluminum, a point of inflection appears on the curves of "grain number versus percentage addition", this point of inflection being related to the peritectic point. In alloys the modifying action of the inoculant additives is even more effective than in the case of pure Al. G.N.

1. Aluminum alloys--Metallurgy
2. Aluminum alloys--Crystallization

Card 1/1

3(5) PHASE I BOOK EXPLOITATION SOV/2284

Moscow. Vsesoyuznyy nauchno-issledovatel'skiy geologo-razvedochnyy neftyanoy institut

Perspektivy nefte-gazonosnosti i napravleniye geologorazvedochnykh rabot v severo-vostochnykh rayonakh Uralo-Volzhskoy neftenosnoy oblasti; vyyezdnaya sessiya uchenogo soveta VNIGNI, Dekabr' 1956 g., Kazan' (Oil-and Gas-bearing Possibilities and the Direction of Geological Exploration in the Northeastern regions of the Volga-Ural Petroliferous Region. Session of the Scientific Council of the All-Union Petroleum Scientific Research Institute for Geological Exploration Held at Kazan; December 1956) Moscow, Gostoptekhizdat, 1958. 257 p. Errata slip inserted. 1,000 copies printed.

Additional Sponsoring Agency: USSR- Ministerstvo geologii i okhrany nedr.

Ed.: A.I. Kleshchev, Candidate of Geological and Mineralogical Sciences; Executive Ed.: P.R. Yershov; Tech. Ed.: E.A. Mukhina.

PURPOSE: This book is intended for petroleum geologist.

COVERAGE: This collection of articles is the result of a field session held in Kazan' in December 1956 by the scientific council of the All-Union Petroleum Scientific Research Institute for Geological Exploration. The session was attended by members of the geological services of the various petroleum research and industrial institutions of Kazan', Bugul'ma, Ufa, Perm', Kuybyshev, etc. The Council discussed the prospects and possibilities of oil and gas production in the northeastern parts of the Volga-Ural oil-bearing district, its current problems in geological surveying and exploration, and plans for future drilling. All reports, presentations, replies to queries, the resolutions and recommendations made by the council, and the chairman's concluding remarks, are reproduced in the collection. The articles are accompanied by diagrams and tables. No references are given.

TABLE OF CONTENTS:

SOV/2284

Oil-and Gas-bearing Possibilities (Cont.)

Card 3/7

MAL'TSEV, M. V.

"Modifying the Ingot Structure of Aluminum Alloys"

Light Alloys. no. 1: Physical Metallurgy, Heat Treatment, Casting, and Forming; Principal Reports of the Conference, Moscow, Izd-vo AN SSSR, 1958, 497 P.

(2nd. A.U. Conf on Light Alloys, 1955)

APPROVED FOR RELEASE: 06/23/11: CIA-RDP86-00513R001031900027-6

MAL'TSEV, M. V. AND CHISTYAKOV, Yu. D.

"Some Ways of Avoiding Contamination of Alloys with Oxide Inclusions"

Light Alloys. no. 1: Physical Metallurgy, Heat Treatment, Casting, and Forming; Principal Reports of the Conference, Moscow, Izd-vo AN SSSR, 1958, 497 P.

(2nd. A.U. Conf on Light Alloys 1955)

MAL'TSEV, M.V.

Prospects for the discovery of new oil pools in the Tatar A.S.S.R.
Uch. zap. Kaz. un. 117 no.9:317-320 '57. (MIRA 13:1)

1.Tatarskiy neftyanoy nauchno-issledovatel'skiy institut.
(Tatar A.S.S.R.--Petroleum--Geology)

YERONIN, V.A.; ~~MAL'TSEV, M.V.~~; VAKHITOV, G.G.; SULTANOV, S.A.

Introducing new machinery and methods in the exploitation of Tatar oil fields. Neft. Khoz. 35 no.10:24-31 O '57. (MIRA 11:1)
(Tatar A.S.S.R.--Petroleum engineering)

APPROVED FOR RELEASE: 06/23/11: CIA-RDP86-00513R001031900027-6

MAL'TSEV, M.V.

137-58-3-6096

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 3, p 236 (USSR)

AUTHORS: Mal'tsev, M. V., Chzhou Shi-Chan

TITLE: Research on Substitutes for Beryllium Bronze (Izyskaniye zameniteley berilliyevoy bronzy)

PERIODICAL: Byul. tsvetn. metallurgii, 1957, Nr 13, pp 15-19

ABSTRACT: The structure and properties of alloys of the Cu-Be-Mn system were studied in connection with a search for alloys which would replace Be bronze and which would contain smaller amounts of the costly and scarce Be. The existence of a quasi-binary system, Cu-$MnBe_2$, was established and a phase diagram was constructed therefor. Heat treatment of the Cu-$MnBe_2$ alloys has shown that the compound $MnBe_2$ is a good strengthening constituent and that the alloys indicated above are good potential substitutes for Be bronzes. According to their mechanical properties, alloys containing 1.2 - 1.6 percent Be and 4.5 - 5.5 percent Mn closely approach the binary Be bronzes containing 2 - 2.5 percent Be.

M. Z.

Card 1/1

70-5-10/31

An Electronographic Investigation of the Processes of Oxidation of Aluminium Alloys.

SUBMITTED: February 22, 1957.

AVAILABLE: Library of Congress.

Card 3/3

70-5-10/31

A. Electronographic Investigation of the Processes of Oxidation of Aluminium Alloys.

The effect of the addition of certain more active metals has been tried. These elements are characterised by high heats of formation of their oxides and low vapour pressures of the metals. Be was the most effective additive found and Ca, Li and Sr were somewhat less efficient. For an alloy of Al + + 5.0% Mg + 0.05% Be the oxide layer was heterogeneous and consisted of a mixture of MgO and BeO but for the surface of the liquid alloy Al + 5.0% Mg + 0.5% Be the oxide layer was entirely BeO. The rate of oxidation of alloys containing various quantities of Mg plus about 0.5% BeO was compared with the previous set of measurements for the same alloys without Be. The rates in this case were 50-100 times less. One of the conditions for rapid oxide production appears to be the capability of forming a spinel-type of compounds ($MeO.Al_2O_3$) at small concentrations of Me in the alloy. There are 8 figures and 10 references, 8 of which are Slavic.

ASSOCIATION: M.I. Kalinin Institute of Non-ferrous Metals and Gold, Moscow. (Moskovskiy Institut tsvetnykh metallov i zolota im. M.I. Kalinina)

Card 2/3

MAL'TSEV, M. V.

70-5-10/31

AUTHORS: Chistyakov, Yu.D. and Mal'tsev, M.V.

TITLE: An Electronographic Investigation of the Processes of Oxidation of Aluminium Alloys (Elektronograficheskoye izucheniye protsessov okisleniya alyuminiyevykh splavov)

PERIODICAL: Kristallografiya, 1957, Vol.2, No.5, pp. 628-633 (USSR).

ABSTRACT: The rate of oxidation of aluminium alloys depends greatly on the nature of the alloying elements. It has been found by electronographic analysis of solid and liquid alloys that 4 groups are sufficient to characterise the processes. The classification depends on the Mg content: - (I) Containing no Mg. Oxide film on the liquid metal contains only Al_2O_3 (gamma alumina. (II) Containing 0.01 to 0.05 % Mg. Oxide film consists of a mixture of gamma alumina and $MgO.Al_2O_3$. (III) Containing 0.05 to 1.5% Mg - most industrial alloys - the surface film consists of a mixture of MgO and $MgO.Al_2O_3$. (IV) Containing more than 1.5% Mg (certain duralumins, magnaliums, etc.) Oxide layer consists of MgO. A graph shows the relationship between the rate of oxidation and the Mg content for Al-Mg alloys at 500 °. The rate of oxidation, very low for pure Al, increases very rapidly with Mg content.

Card 1/3

MAL'TSEV, M.V.

Geological structure in the Romashkino oil field. Geol.nefti 1 no.11:50-56 N '57. (MLRA 10:9)
(Tatar S.S.S.R.--Petroleum geology)

MAL'TSEV, M.V.

Prospects for discovering new oil pools in the Ural and Volga regions. Geol. nefti 1 no.6:1-7 Je '57. (MIRA 10:8)

(Ural Mountain region--Petroleum geology)
(Volga Valley--Petroleum geology)

APPROVED FOR RELEASE: 06/23/11: CIA-RDP86-00513R001031900027-6

RG

137-1958-2-2683

Modifying the Structure of Ingots of Industrial Aluminum Alloys

the tests: 1) the most intensive size reduction of the grain was observed with Ti concentrations of 0.05 - 0.1 percent; for better assimilation of the Ti by the alloy the former had to be introduced as a diluted alloying element (with a 3-4 percent Ti content) at the beginning of smelting, along with the basic charge; it was not desirable to superheat the modified alloy to temperatures $> 740\text{-}760^{\circ}$; 2) as a result of the double smelting the Ti content dropped by more than 0.01 percent; 3) the modification interfered to some degree with liquation within the ingot; 4) the greatest improvement in the mechanical properties was observed when Ti concentrations were such as to produce maximum size reduction of the grain (i.e., 0.07 - 0.1 percent).

G.S.

1. Aluminum alloys--Modification

Card 2/2

137-1958-2-2683

Mal'tsev, M.V.

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 2, p 69 (USSR)

AUTHORS: Mal'tsev, M.V., Livanov, V.A., Kuznetsov, K.I., Glazov, V.M.

TITLE: Modifying the Structure of Ingots of Industrial Aluminum Alloys (Modifitsirovaniye struktury slitkov promyshlennykh alyuminiyevykh splavov)

PERIODICAL: V sb.: Metallurg. osnovy lit'ya legkikh splavov. Moscow, Oborongiz, 1957, pp 140-154

ABSTRACT: A detailed study was made of the effect had by modification on the mechanical and technical properties of Al alloys. Tested were a D16 (aircraft Duralumin) alloy composed of 4.5 percent Cu, 1.52 percent Mg, 0.6 percent Mn, 0.15 percent Fe, and 0.25 percent Si and an AMts (aircraft aluminum) alloy composed of 1.62 percent Mn, 0.26 percent Fe, and 0.2 percent Si, the rest being Al. The alloys were prepared from industrial Al waste (mark AO), electrolytic Cu, Mg, and an Al-Mn alloying element. Ti was added as the modifying agent. The smelting was done in an SAN-type electric furnace with a capacity of up to 2,000 kg. The ingots were semicontinuous-cast. The basic tests were made on round ingots 170 mm in diameter. The following emerged from

APPROVED FOR RELEASE: 06/23/11: CIA-RDP86-00513R001031900027-6

136-6-13/26

Investigation of the Properties of Aluminium-Iron-Manganese Bronzes.

hardening from 850-900 °C alloys at the low-aluminium range can be given a tensile strength and hardness about 30 and 65%, respectively, greater than the standard values without loss of plasticity. With nominal-aluminium alloys hardening temperatures of 750-800 °C are effective, hardening after mechanical working is recommended for high-aluminium alloys only if plasticity is not important.
There are 3 figures, 2 tables and 8 references, of which 5 are Slavic.

AVAILABLE: Library of Congress

Card 2/2

MAL'TSEV, M.V.

136-6-13/26

AUTHOR: Mal'tsev, M.V. and Vigdorovich, V.N.

TITLE: Investigation of the Properties of Aluminium-Iron-Manganese Bronzes. (Issledovaniye svoystv alyuminiyevo-zhelezo-margantsovistykh bronz)

PERIODICAL: Tsvetnyye Metally, 1957, pp. 62-67 (USSR)

ABSTRACT: Type БрЖМц 10-3-1.5 bronze (9-11% Al, 2.0-4.0% Fe, 1.0-2.0% Mn according to ГОСТ 493-54) has excellent anti-friction and mechanical properties and is widely used for machine construction e.g. high-pressure pumps. This article, after dealing with relevant phase diagrams taken from the literature, goes on to describe the authors' work on this alloy. The work was carried out at the Krasnyy Vyborzhets Works and the metallurgical laboratory of the Moscow Institute for Non-ferrous Metals and Gold (Moskovskiy Institut Tsvetnykh Metallov i Zolota). This consisted mainly in hardness and strength determinations on copper-aluminium and copper-aluminium-iron-manganese alloys of various compositions and subjected to various heat treatments. The results are tabulated and shown graphically and phase changes are discussed with the aid of micro-structural data. It was found that with the permitted variations in composition the mechanical properties could differ considerably from those specified in the ГОСТ. By

Card 1/2

Mal'tsev, M. V., Doctor of Technical Sciences, Docent. Means of Improving Quality of Nonferrous Castings 12

This paper reports that experiments conducted during the last few years by the department of metallurgy at the Moskovskiy institut tsvetnykh metillov i zolota (Moscow Institute for Nonferrous Metals and Gold) showed that the quality of nonferrous castings may be considerably improved by adding small amounts of certain elements which change the process of crystallization and solidfication of metals. These elements are said to effect the grain size and the distribution of alloying elements. Experiments were carried out with aluminum alloys to which small amounts (0.1 to 0.01 per cent) of titanium, zirconium, columbium, chromiun, molybdenum, tungsten and boron had been added. The author concludes that this method of controlling the mechanical and other properties of castings by adding certain elements may have extensive practical applications. No personalities are mentioned. There are no references.

Chursin, V. M., Candidate of Technical Sciences. Effect on Structure and Properties of Lead Bronzes of Addition of Small Amounts of Certain Elements 31

Industry). The book contains 20 articles dealing with theoretical and practical aspects of casting of nonferrous metals. See Table of Contents for abstracts of individual articles.

TABLE OF CONTENTS:

The author reviews the history and the various properties of lead bronze. He relates the results of his investigations into the effects of various factors present during solidification, on the grain size and structure of this alloy. He also mentions the cause of gaseous inclusions. Various means of refining this alloy by fluxes and deoxidizers are mentioned. Blowing with inert gases is said to be still in an experimental stage. No personalities are mentioned. There are no references.

Card ~~2/17~~

MAL'TSEV, M.V.

PHASE I BOOK EXPLOITATION 509

Nauchno-tekhnicheskoye obshchestvo mashinostroitel'noy promyshlennosti

Fasonnoye lit'ye mednykh splavov: [sbornik] (Shaped Casting of Copper Alloys; Collection of Articles) Moscow, Mashgiz, 1957. 205 p 6,500 copies printed.

Ed.: Orlov, N. D., Candidate of Technical Sciences; Eds.: Ignatenko, Yu. F., Engineer; Telis, M. Ya., Engineer; and Chursin, V. M., Candidate of Technical Sciences; Ed. of Publishing House: Chernysheva, N. P.; Tech. Ed.: El'kind, V. D.

PURPOSE: This collection of articles is intended for engineers, technicians, and workers engaged in casting nonferrous metals. It may also be used by students, graduate students and scientific workers in this field.

COVERAGE: This book contains papers presented during a technical and scientific convention held in Moscow in December 1955, on the theory and practice of shaped copper-alloy castings. This convention took place under the auspices of the komitet tsvetnogo lit'ya Tsentral'nogo pravleniya NTO Mashprom (Committee on Nonferrous Castings of the Central Administration of the Scientific and Technological Division of the Machine

Card 1/17

MAL'TSEV, M.V.

TROYEPOL'SKIY, V.I.; ELLERN, S.S.; MAL'TSEV, M.V.; SOLGANIK, G.Ya., red.
IBRAGIMOVA, Z.A., tekhn.red.

[Tataria is a petroleum republic; a popular account] Tatariia - respublika nefti; nauchno-populiarnyi ocherk. Kazan', Tatknigoizdat, 1957. 154 p. (MIRA 11:7)
(Tatar A.S.S.R.--Petroleum industry)

Name: MAL'TSEV, Mikhail Vasil'yevich

Dissertation: Modification of the Structure of Metals and Alloys

Degree: Doc Tech Sci

Affiliation: /not indicated/

Defense Date, Place: 17 Jan 55, Council of Inst of Non-Ferrous Metals and Gold imeni Kalinin

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